

1 VQE results Aer Estimator (No Shots)

(Full Hamiltonian)			Harmonic Oscillator		$\Lambda = 32$	COYBLA Max 10K Iterations			
Ansatz	Tolerance	Converged runs	Mean iter	VQE min E.	Δ_{min}	VQE median E.	Δ_{median}	Exact	Time
RA r1 rl	1e-01	100/100	115	3.0284e-02	3.0284e-02	1.314e-01	1.314e-01	0e+00	00h 00m 30s
RA r1 rl	1e-02	100/100	282	2.3553e-04	2.3553e-04	1.775e-03	1.775e-03	-	00h 01m 09s
RA r1 rl	1e-03	100/100	479	2.6628e-06	2.6628e-06	2.1504e-05	2.1504e-05	-	00h 01m 51s
RA r1 rl	1e-04	100/100	741	5.29e-08	5.29e-08	2.0633e-07	2.0633e-07	-	00h 02m 37s
RA r1 rl	1e-05	100/100	1221	5.1676e-10	5.1676e-10	2.1431e-09	2.1431e-09	-	00h 04m 26s
RA r1 rl	1e-06	98/100	1517	5.774e-12	5.774e-12	2.5405e-11	2.5405e-11	-	00h 06m 03s
RA r1 rl	1e-07	98/100	1400	4.2188e-14	4.2188e-14	2.4e-13	2.4e-13	-	00h 05m 45s
RA r1 rl	1e-08	93/100	1687	1.0381e-14	1.0381e-14	8.854e-14	8.854e-14	-	00h 08m 30s
Ansatz	Tolerance	Converged runs	Mean iter	VQE min E.	Δ_{min}	VQE median E.	Δ_{median}	Exact	Time

Table 1